RF TRANSCEIVER HAVING A DIRECTLY RADIATING TRANSISTOR

ABSTRACT OF THE DISCLOSURE

Transistor package leads form quarter-wave antenna elements that directly radiate RF energy into free space without the need for a separate antenna. The transistor operates at a fundamental frequency and radiates a harmonic, thereby allowing radiation at frequencies normally considered "beyond cutoff" for a packaged transistor. This technique enables an additional 20GHz of spectrum for use by surface mount technology. The transistor may be mounted on 1.6mm thick glass-epoxy circuit board that also forms a quarter-wave reflector at 26GHz. An optional dielectric lens produces a narrow beam and an optional planar filter rejects spurious fundamental emissions. A 26GHz ultra-wideband (UWB) pulse-echo radar rangefinder implementation provides a low-cost upgrade to ultrasound.